

IN THE CLAIMS:

1. (Currently amended) An electronically tuned circuit, comprising a power amplifier coupled to an electronically tunable output network, said power amplifier capable of being operated in a large-signal mode, said output network including an electronically tunable reactive component, wherein electronic tuning of said electronically tunable reactive component includes non-mechanical electronic tuning when said power amplifier is operated in said large-signal mode.
2. (Previously amended) An electronically tuned circuit as in claim 1, wherein said output network is adapted to be tuned to a selected frequency.
3. An electronically tuned circuit as in claim 1, wherein said output network is adapted to be adjusted to match a selected load impedance.
4. (Previously amended) An electronically tuned circuit as in claim 1, wherein said output network is adapted to produce a modulated signal at the network output.
5. (Previously amended) An electronically tuned circuit as in claim 4, wherein said output network is further adapted to provide a power-amplifier load-impedance locus that substantially maximizes power-amplifier efficiency.
6. (Previously amended) An electronically tuned circuit as in claim 4, wherein said output network is further adapted to follow a substantially resistive power-amplifier impedance locus, thereby maintaining power-amplifier efficiency near maximum.
7. (Previously amended) An electronically tuned circuit as in claim 1, wherein said output network is adapted to be tuned in accordance with a predetermined set of tuning inputs.

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- 1 8. (Previously amended) An electronically tuned circuit as in claim 7, wherein said
2 tuning inputs are selected in accordance with a lookup table.
- 1 9. (Previously amended) An electronically tuned circuit as in claim 1, wherein said
2 output network is adapted to be tuned in accordance with a predetermined lookup
3 table of tuning inputs.
- 1 10. (Withdrawn and currently amended) An electronically tuned ~~radio-frequency power~~
2 ~~amplifier circuit~~ as in claim 1, wherein said output network is adapted to be tuned in
3 accordance with a sample of the amplifier output.
- 1 11. (Withdrawn and currently amended) An electronically tuned ~~radio-frequency power~~
2 ~~amplifier circuit~~ as in claim 1, wherein said output network is adapted to be tuned in
3 accordance with a sample of the network output.
- 1 12. (Withdrawn and currently amended) An electronically tuned ~~radio-frequency power~~
2 ~~amplifier circuit~~ as in claim 1, wherein said output network is adapted to be tuned in
3 accordance with a sample of a radiated signal.
- 1 13. (Previously amended) An electronically tuned circuit as in claim 1, wherein said
2 electronically tunable reactive component includes an electronically tunable
3 capacitor.
- 1 14. (Previously amended) An electronically tuned circuit as in claim 13, wherein said
2 electronically tunable capacitor includes a transistor.

15. (Previously amended) An electronically tuned circuit as in claim 13, wherein said electronically tunable capacitor includes a diode.
16. (Previously amended) An electronically tuned circuit as in claim 13, wherein said electronically tunable capacitor includes a diode having a control terminal.
17. (Previously amended) An electronically tuned circuit as in claim 13, wherein said electronically tunable capacitor includes a micro electro-mechanical system device.
18. (Previously amended) An electronically tuned circuit as in claim 13, wherein said electronically tunable capacitor includes a variable-dielectric material.
19. (Previously amended) An electronically tuned circuit as in claim 13, wherein said electronically tunable capacitor includes a piezo-electric device.
20. (Withdrawn and currently amended) An electronically tuned radio-frequency power amplifier circuit radio-frequency power amplifier as in claim 1, wherein said at least two reactive components include at least one inductive component adapted to be electronically tuned in inductance.
21. (Withdrawn and currently amended) An electronically tuned radio-frequency power amplifier circuit as in claim 20, wherein said at least one inductive component includes a variable permeability core.
22. (Withdrawn and currently amended) An electronically tuned radio-frequency power amplifier circuit as in claim 20, wherein said at least one inductive component includes a piezo-electric device.

23. (Withdrawn and currently amended) An electronically tuned radio-frequency power amplifier circuit as in claim 1, wherein said at least two reactive components include at least one transmission line adapted to be electronically tuned in electrical characteristics.
24. (Withdrawn and currently amended) An electronically tuned radio-frequency power amplifier circuit as in claim 23, wherein said at least one transmission-line component includes an electrically variable dielectric material.
25. (Withdrawn and currently amended) An electronically tuned radio-frequency power amplifier circuit as in claim 23, wherein said at least one transmission-line component includes an electrically variable magnetic material.
26. (Withdrawn and currently amended) An electronically tuned radio-frequency power amplifier circuit as in claim 1, further comprising a passive filter coupled to said output network for removing undesired harmonic frequencies.
27. (Withdrawn and currently amended) An electronically tuned radio-frequency power amplifier circuit as in claim 1, further comprising a second electronically tuned filter coupled to the amplifier input of said amplifier for tuning the amplifier input.
28. (Previously amended) An electronically tuned circuit as in claim 1, further comprising a controller, said controller for providing a signal for controlling said electronically tunable output network.

29. (Previously amended) An electronically tuned circuit as in claim 28, further comprising an envelope detector with an envelope-detector input and envelope-detector output, said envelope-detector output coupled to the input of said controller, said envelope detector being responsive to an input RF signal and providing a modulation input to said controller.
30. (Previously amended) An electronically tuned circuit as in claim 28, further comprising a drive-level adjustor coupled for adjusting amplitude of a signal provided to said power amplifier.
31. (Previously amended) An electronically tuned circuit as in claim 1, further comprising a digital signal processor coupled to said power amplifier and to said electronically tunable output network, said processor for providing a drive signal to said power amplifier and a tuning signal to said electronically tunable output network.
32. (Previously amended) An electronically tuned circuit as in claim 31, further comprising a controller coupled to said digital signal processor and to said electronically tunable output network, wherein output of said digital signal processor is directed to said controller and wherein output of said controller is directed to said electronically tunable output network.
33. (Previously amended) An electronically tuned circuit as in claim 1, further comprising a drive-level adjustor coupled for adjusting amplitude of a signal provided to said power amplifier.

34. (Previously amended) An electronically tuned circuit as in claim 33, wherein said electronically tunable output network and said drive-level adjuster are adapted to produce a modulated signal.

35. (Previously amended) An electronically tuned circuit as in claim 34, wherein said circuit is for providing a desired circuit output, wherein when said desired circuit output is above a threshold said electronically tunable output network is used to control amplitude and when said desired circuit output is below a threshold said drive level adjuster is used to control amplitude.

36. (Previously amended) An electronically tuned circuit as in claim 33, further comprising a controller for converting a modulation input into tuning signals for control of said electronically tuned network.

37. (Previously amended) An electronically tuned circuit as in claim 1, further comprising a bias input for setting bias level of said power amplifier.

38. (Previously amended) An electronically tuned circuit as in claim 37, wherein said bias level is adapted to the minimum level necessary to enable operation of the power amplifier, thereby reducing power consumption.

39. (Previously amended) An electronically tuned circuit as in claim 37, further comprising a controller for adjusting said bias level in response to frequency, impedance, and modulation inputs.

1 40. (Currently amended) An electronically tuned circuit comprising:

2 (a) means for power amplifying, wherein said means for power amplifying
3 comprises a large-signal mode; and

4
5 (b) means for electronic tuning of said means for power amplifying when
6 said means for power amplifying is operating in said large signal
7 mode, wherein said means for electronic tuning is coupled to said
8 means for power amplifying, wherein said means for electronic tuning
9 comprises an electronically tunable reactive component, wherein said
10 electronically tunable reactive component includes non-mechanical
11 electronic tuning.

1 41. (Previously amended) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and said electronic-tuning means is
3 capable of being tuned to provide a reactance for optimum class-E operation for a
4 selected frequency.

1 42. (Previously amended) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and said electronic-tuning means is
3 capable of being tuned to provide a reactance for optimum class-E operation while
4 delivering power to a selected load impedance.

1 43. (Previously amended) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and said electronic-tuning means is
3 capable of being tuned to provide a reactance for optimum class-E operation while
4 simultaneously modulating the output of said electronic-tuning means.

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1 44. (Previously amended) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and further comprising a fixed
3 reactance for optimum class-E operation at a first frequency, wherein said
4 electronic-tuning means is capable of being tuned to provide said power amplifying
5 means with a load impedance for optimum class-E operation for a selected second
6 frequency.

1 45. (Previously amended) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and further comprising a fixed
3 reactance for optimum class-E operation with a first load impedance, wherein said
4 electronic-tuning means is capable of being tuned to provide said power amplifying
5 means with a load impedance for optimum class-E operation with a second load
6 impedance different from said first circuit load impedance.

1 46. (Previously amended) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and said electronic-tuning means is
3 capable of being tuned to provide an impedance for optimum class-E operation
4 when the circuit is delivering a maximum output signal amplitude, and said
5 electronic-tuning means is capable of being tuned to provide suboptimum class E
6 operation when the circuit is delivering less than a maximum output signal
7 amplitude.

47. (Withdrawn and currently amended) An electronically tuned radio-frequency power amplifier system circuit as in claim 1, comprising a plurality of amplifier subsystems coupled to and a power combiner with a plurality of inputs, for delivery of signals from said amplifier subsystems to a common load, wherein each said amplifier subsystem comprising (a) a power amplifier coupled to an electronically tunable output network, said power amplifier capable of being operated in a large-signal mode, said output network including an electronically tunable reactive component, wherein electronic tuning of said electronically tunable reactive component includes non-mechanical electronic tuning when said power amplifier is operated in said large-signal mode having an amplifier input and an intermediate output, and (b) an output network coupled to said intermediate output of said power amplifier, said output network including a tuning input, a network output, and at least one reactive component being adapted to being electronically tuned by a tuning signal applied to said tuning input; the network outputs of each subsystem being coupled to inputs of the power combiner for delivery of signals from all power amplifiers to a common load.
48. (Withdrawn and currently amended) An electronically tuned radio-frequency power amplifier system as in claim 47, wherein said output networks are adapted to be tuned to selected frequencies.
49. (Withdrawn and currently amended) An electronically tuned radio-frequency power amplifier system as in claim 47, wherein said output networks are adapted to be tuned to match desired load impedances.
50. (Withdrawn and currently amended) An electronically tuned radio-frequency power amplifier system as in claim 47, wherein said output networks are adapted to modulate the signals from the said power amplifiers.
51. (Withdrawn and currently amended) An electronically tuned radio-frequency power amplifier system as in claim 47, wherein said output networks are adapted to cancel reactances resulting from the combining of the said plurality of signals.
52. (Withdrawn and currently amended) An electronically tuned radio-frequency power amplifier system as in claim 47, further comprising a controller with a controller input and controller outputs for each subsystem, said controller for generating RF-drive and control signals for each subsystem.
53. (Withdrawn and currently amended) An electronically tuned radio-frequency power amplifier system as in claim 52, wherein said controller is adapted to generating RF drive signals of different phases for production of an amplitude-modulated system output.

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- 1 54. (Withdrawn and currently amended) An electronically tuned radio-frequency power
2 amplifier system as in claim 52, wherein said output networks are adapted to cancel
3 the time varying reactances resulting from combining out-of-phase signals, thereby
4 improving efficiency and other operating characteristics of the power amplifiers.
- 1 55. (Withdrawn and currently amended) An electronically tuned radio-frequency power
2 amplifier as in claim 47, further comprising a passive filter coupled to said power
3 combiner for removing undesired harmonic frequencies and distortion products.
- 1 56. (Currently amended) An electronically tuned circuit, comprising one or more power
2 amplifiers, wherein said power amplifiers are capable of operating in a large-signal
3 mode, further wherein each of said one or more power amplifiers having has an
4 output network, said output network including a tuning input, a network output, and
5 an electronically tunable reactive component, wherein electronic tuning of said
6 electronically tunable reactive component includes non-mechanical electronic tuning
7 when said power amplifiers are operating in said large-signal mode.
- 1 57. (Previously amended) An electronically tuned circuit as in claim 56, wherein said
2 output network is adapted to be tuned to a fixed or variable frequency.
- 1 58. (Previously amended) An electronically tuned circuit as in claim 56, wherein said
2 output network is adapted to be adjusted to match a fixed or variable load impedance
3 at said network output.
- 1 59. (Previously amended) An electronically tuned circuit as in claim 56, wherein said
2 output network is adapted to produce a modulated signal at said network output.
- 1 60. (Previously added) An electronically tuned circuit as in claim 1, wherein said output
2 network includes at least two reactive components connected as a tuned circuit,
3 wherein at least one of said reactive components is adapted to being electronically
4 tuned by a tuning signal.
- 1 61. (Previously added) An electronically tuned circuit as in claim 28, wherein said
2 controller converts an input signal to a voltage suitable for controlling said tunable
3 output.